Eskom	SCOPE OF WORK FOR KENDAL PS WHITE METAL BEARINGS & THRUST PADS REFURBISHMENT SOW	Doc no.	
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Kendal Power Station	Document Type Scope Of Work	Unit applicability	0 x | 1 √ | 2 √ | 3 √ | 4 √ | 5 √ | 6 √

Compiled & Recommended	Thinga Tshikovhi System Engineer		06/03/2020
Supported by	Kubashan Moodley Turbine Engineering Manager		09/03/2020

Supported by	N D RAKOLOTA *Turbine Maintenance Tech Support*		12/03/2020
Supported by	T. V MOJELA Outage Controller		10/03/2020
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Supported by	TSHEPO MAKOTA Quality Assurance		16/07/2020
	Name	Signature	Date

	Page		Page

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0	Original	2009-08
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For information only, unless otherwise specified

Contents

1. Scope of work/works information for Kendal Power Station re-metalling of journal bearings and thrust-pads:

The scope for the Transportation and Assessment part of this contract is as follows:

- The collection and transportation of Bearings & Thrust Pads from and to Kendal Power Station Eskom Stores
- Packaging The supplier shall ensure that the bearings and thrust pads is properly packaged to prevent damage or deterioration during transportation, handling and storage
- Stripping of Bearings and marking all parts with unique numbers relevant to job number
- Small parts be marked with relevant job number
- Perform pre-cleaning assessment
- All parts are to be cleaned properly, corroded parts to be sandblasted
- Carry out a full assessment as per applicable OEM specification A detailed report in PDF format to be available for the Eskom Engineering and Maintenance Technical Support who will be performing the assessment pre-repairs
- The contractor to be available for site installation where required

General Technical Requirements:

- All oil ports, oil ways, holes, grooves and recesses shall be free from debris or any obstruction that may restrict oil flow
- All edges and corners shall be free of burrs, rags and slivers
- The bearing back shall be free from burrs, bruises or other damage, which may interfere with the correct seating of the bearing in the housing
- The lining shall be free from inclusions, porosity, blisters, blow holes and any defects which may reduce the integrity of the lining No defects shall be allowed in the load carrying area and near any jacking oil ports or oil ways

Shell cleaning and preparation:

- The following minimum steps are suggested for the preparation of a bearing shell prior to relining Should the manufacturer's method differ significantly, this shall be brought to Eskom's attention for approval prior to relining.
- Prior to tinning, the shell shall be thoroughly degreased with a suitable solvent degreaser If size permits the shell should be degreased in a solvent tank
- Old white metal shall be removed by immersion in a melting off pot if size permits, alternatively using a blowpipe
- Old oil or grease should be burned out with a blowpipe if the surface remains contaminated after the above treatments
- Any portions of the surface, which remain contaminated or highly polished, should be filed or ground
- Parts, not to be relined, should be protected, by coating with whitewash or washable distemper and drying
- Bolt holes, water jacket apertures, lubrication ports etc , should be plugged with a removable filler and dried before relining

Surface finish:

- The supplier shall determine the method of machining to achieve an even surface finish free from waviness, high spots and surface defects

Distortion:

- The supplier shall be responsible for ensuring that the mating faces of bearing halves are matched and that the internal circumference of the bearing is round or for elliptical bearings to the required dimensions
- Where possible, the bearing housing should accompany the bearing to be re-metalled
- The bearing outside diameter must be checked for conformance to original specifications
- No re-metalling shall be carried out if doubt exists that the bearing can be refurbished without excessive distortion

Verification and Tests:

- The supplier shall record all the relevant dimensions and features of the bearing on a drawing to be submitted together with the finished bearing
- The supplier shall determine the degree of bonding by means of an ultrasonic method complying with BS 7585 Part 1, or equivalent method Personnel performing ultrasonic testing shall be qualified in terms of Eskom Standard ESKASAAA3.
- The supplier shall hard stamp the bearing with the relevant bearing or job number
- Prior to pouring, the supplier shall carry out detailed chemical analyses of the bearing material used by means of a suitable spectrometric test method
- The supplier shall check the bearing for straightness and cylindricity by means of a suitable method/s
- The findings are to be recorded on the dimensional verification sheet.
- The supplier shall inspect the surface finish and record the condition on the dimensional verification sheet. For all turbine bearings, boiler feed pump bearings and prototype bearings, a controlled sample using the same melt shall be poured and metallographically examined. The micrograph is to be recorded and included as part of the quality documents

Documentation:

The supplier submit the below documentation with each delivery

- Detailed bond test certificate
- Applicable NDT certificates
- Detailed chemical analysis certificate showing actual analysis of the cast and the requirements of the material specification
- A drawing and dimensional verification sheet indicating all relevant final machined dimensions and machined clearances
- A completed quality control plan certificate

2. Material List

No.	Plant Area	Description	Stock Number
1	Milling Plant	Trunnion Bearing - (Mill DE & NDE)	177168
2	Draught Plant	6 1/2" SAFL Bearings - (ID Fan DE & NDE)	178560
3	Draught Plant	FAN BEARING (DE & NDE) 10"	177155
4	Draught Plant	FAN BEARING (DE & NDE) 12"	177156
5	Draught Plant	FD Fan motor NDE	34810
6	Draught Plant	Motor DE & NDE	34774
7	Draught Plant	Motor NDE	34808
8	Boiler Feed Pumps	Journal bearing complete DE/NDE (RT 134 02) – (BFP Main Pump)	31583
9	Boiler Feed Pumps	'THRUST BEARING complete M8246/2BP – (BFP Main Pump)	33262
10	Boiler Feed Pumps	Thrust Bearing complete (set incl DE/NDE) – (Booster Pump)	31580
11.	Boiler Feed Pumps	Journal Bearing HSS (set) =2 bearings - Renk Gearbox	34811
12	Boiler Feed Pumps	Journal Bearing LSS (set) = 2 bearings – Renk Gearbox	34812
13.	Boiler Feed Pumps	Thrust bearing (set) = 2 bearings – Renk Gearbox	31584
14	Boiler Feed Pumps	Journal bearing complete DE (EZVR18) – BFP Motor	34764
15	Boiler Feed Pumps	Journal bearing complete NDE (EZVR18) – BFP Motor	34813

16	Boiler Feed Pumps	Journal bearing complete EXITOR (EZVQ11-110) – BFP Motor	34765
17	Main Cooling Water	Bearing, sleeve type journal, inside diameter 140 mm	177165
18	Main Cooling Water	Bearing, sleeve type journal, inside diameter, 305 mm	177160
19	CEP	Thrust pad lower bearing(DE)	45053
20	CEP	Thrust pad upper Bearing(NDE)	45054
21	CEP Thrust Pad	Bearing pad Journal	33213
22	Other	Motor exciter end, part no: ezvq11-110, supplier unknown; vendors are responsible for ensuring that they are performing against the correct drawing revision number (if applicable)	34767
23.	Other	Bearing, sleeve material stl, for use on electric feed pump shaft height 115 mm, bolt mounting 2, bolt diameter 26 mm, housing material stl, without bearings, part no snu520-617fsq, supplier unknown, part no snh22520, supplier unknown,	34768
24.	Other	Thrust bearing complete m8246/2bp	33262
25	Other	Bearing, sleeve type liner de/nde, inside diameter 100 mm, feed pump, article no' 104-187-174-500, model no hptpk300774350, part no 313-01, vendors are responsible for ensuring that they	31585
26	Other	Bearing, sleeve type outboard, inside diameter 170mm;outside diameter 190 mm, material stl, champered and hard chromed, part no dms1538, supplier unknown	255553
27	Other	Bearing, sleeve type journal, inside diameter 500 mm, diameter 420 mm; length 290 mm, material white metal, part no: 16205, supplier unknown, vendors are responsible for	34575
28	Other	Bearing, sleeve' type journal, inside diameter 500 mm, material white metal, item no: 25 03 03, duty extra heavy, style open, type, width 500mm, drawing no 7253-36215, part no ka052b013, supplier unknown, vendors are responsible for	33233
29	Other	Bearing, sleeve, type journal, inside diameter: 280 mm, material white metal, duty extra heavy, width 400 mm, drawing no 7353-26215, part no a052b120, supplier unknown,	33232
30	Other	Bearing, sleeve type journal, de/nde, for use on electrical mm, outside diameter 110 mm, width 22 mm, style doubleseal; part no 6212/2rsr, supplier unknown, vendors are responsible	31610
31	Other	Bearing, thrust material white metal, style pad; for use on outside diameter 190 mm, material stl, champered and hard chromed, part no dms1538, supplier unknown,	250970
32	Other	Bearing, sleeve type, shell nde, inside diameter 181 mm, material ci, inside diameter 30 mm, bolt diameter, m11, block size sq 108 x thk 38 mm, spherical self aligning, part no ucf206, supplier unknown, vendors are responsible for ensuring	34828
33	Other	Bearing, sleeve inside diameter 140 mm, outside diameter 255 mounting 4, shape sq, housing material ci, inside diameter 65 mm, bolt diameter 19 mm, block size lg 187 x thk 70 mm, duty' medium, part no ucf213, supplier unknown, vendors are	34807

3. Quality Requirements

a. General

a) The Supplier complies with the Purchaser's quality and technical requirements including those listed in the Purchaser's specification document QM58
b) The *Supplier* submits a QMS as a returnable schedule and uses it for all phases of the Project The QMS complies with the requirements of ISO 9001 standard. The *Supplier* provides evidence of a fully implemented QMS as and when requested by the *Purchaser* The *Purchaser* will carry out an audit on the *Supplier*, the *Supplier*'s Subcontractors

b. Quality Management documents requirements

The *Supplier* submits the following documents, within 30 days of the Contract Date, to the *Purchaser* for review and acceptance and prior to the commencement of work
The *Supplier* will supply the *Purchaser* with a QCP which will detail the *Supplier's* organisation, quality assurance and quality control procedures specific to this project. The QCP must be aligned to, and reference ISO 10005 2005 QMS, guidelines for quality plans and in compliance with the guideline in QM 58 The QCP will make reference to the *Supplier's* QMS Procedures to be used in this Contract:

a) The *Supplier*'s QMS compliance with the requirements of ISO 9001
b) *Supplier*'s quality manual
c) *Supplier*'s quality procedures
d) *Supplier*'s quality forms and work instructions
e) *Supplier*'s quality system documents referenced in this *Goods Information*

The *Supplier* supplies the *Purchaser* with a QCP or ITP for review and acceptance
The *Supplier* supplies the *Purchaser* with a detailed contract organogram showing the quality personnel to be used in the Contract The *Supplier* provides CVs of the quality management employees who will be responsible for quality.
Quality Management employee's responsibilities include but are not limited to the following:

a) Implementation of the QMS
b) Administration of QA/QC systems
c) Verification of approval status of Subcontractor's QCP and procedures
d) On-and -offsite inspections
e) Co-ordination, inspection and verification of the *Purchaser's* intervention points
f) Review of Contractor testing and inspection documents (procedures, test results)
g) Reporting on quality performance

The *Supplier* submits as a minimum the following documents, as required by the *Purchaser*, which requirement does not constitute a compensation event, during the manufacture of the *Goods*:-

a) Updated QCP register
b) Inspection notifications accompanied by their inspection report
c) Non-conformance and Defects registers and reports
d) Updated Site and off site inspection schedules.
e) Inspection and or FAT dates.
f) Inspections completed/outstanding.
g) Inspection and test reports
h) Monthly contract quality progress report
i) Data books for the completed Goods

c. Quality Responsibility

c) The *Supplier* is accountable for the quality of the output and liable for any failures
d) The *Supplier* is responsible for defining the level of intervention of QA/QC or inspections. These are in line with the *Purchaser's* requirements
e) The *Supplier* is responsible for defining the level of intervention of QA/QC or inspections to be imposed on his sub-Contractor, suppliers and sub-suppliers and must ensure that these are in line with the *Purchaser's* requirements
f) The intervention requirements take into consideration the criticality of the plant.
g) The interventions points include all witness, hold, verification and review points required by the *Purchaser*. The *Supplier*'s failure to allow the intervention points will constitute a non-conformance

d. Non Conformances and Defects

Where NCR's and Defect notifications are issued, the *Supplier* acknowledges receipt as per reply period and proposes corrective and preventive actions to the *Purchaser* as per the contract response period. The corrective and preventive actions will include the implementation and completion dates. Progress on all NCR's and Defect notifications issued to the *Supplier* must be reported to the *Purchaser* on weekly basis.

a) The *Supplier's*'s quality manager keeps a register of all NCR's and Defect notifications issued
b) Deviations from the Contract are treated as a non-conformance
c) Records of NCRs and Defect notifications are kept and form part of the data book records

To ensure reduction of non-conformances, the *Purchaser* will implement a penalty to the value of R50 000 00 for every five (5) NCRs issued during the contract period
During the contract execution phase, the *Supplier* will be monitored by the *Purchaser* for performance on quality related aspects. The monitoring will be in the form of audits and assessments

i. **Quality Reporting**

The *Supplier* submits a monthly quality report, on the last working day of the month. The report includes but not limited to the following:

a) A register of NCRs and defects
b) Updated QCP / ITP register
c) QA monthly report summary
d) Planned and completed local and foreign inspection dates
e) Completed and outstanding Inspections
f) Audit findings report